OPERATION AND MAINTENANCE PLAN

FLOODWATER RETARDING AND WATER SUPPLY STRUCTURE A-6-h

Anytown, Anystate

This document supplements the Operation and Maintenance Agreement signed by the USDA, Natural Resources Conservation Service and the Anycounty Conservation District, Moose Hill Water District and Anytown, Anystate dated **April 30, 2003.** It may be revised by mutual consent of all signatory parties.

This plan defines responsibilities for operating, inspecting, and maintaining floodwater retarding and water supply structure A-6-h. These responsibilities shall remain in effect for the program life of 100 years from the date the structure is determined complete by NRCS. After the expiration of this O&M Plan, the Sponsors may still continue to be liable until the structure is removed or modified to eliminate potential hazards.

Description of the Practice:

Floodwater retarding and water supply structure A-6-h, is located approximately 5 miles southwest of Anytown on Cobb Brook, which is a tributary to the Main River in Anycounty, Anystate. This structure was designed as a high hazard dam. The dam is owned by the Moose Hill Water District, and serves as a supplemental water supply for Anytown, Anystate. The dam is a homogenous earth structure, 350 feet long, with a height of 23 feet. The principal spillway inlet is a rectangular concrete drop box, 4 feet by 9 feet, 23 feet high. The spillway outlet is a 48-inch diameter concrete conduit with a concrete impact basin. A 100-foot wide grassed auxiliary spillway is located on the east abutment. Access to the water supply elements is through a metal bulkhead located in the west abutment of the dam.

Estimated Annual O&M Costs:

The Moose Hill Water District is responsible for financing the operation and maintenance activities for floodwater retarding structure A-6-h. Funds for these activities will be obtained from assessments to the District's water users and will be held in an operation and maintenance escrow account until needed. It is estimated that the average annual cost of maintenance will be $4,500 for this structure. Estimated annual O&M costs are as follows (unused amounts will be added to escrow account each year):

Vegetation (mowing, liming, fertilizing)	$ 2,500
Debris removal	$ 500
Concrete repair/replacement	$ 500
Metalwork (trash racks, railings, drainage)	$ 500
Unforeseen and long term maintenance needs (escrow account)	$ 500

Operation:

The Moose Hill Water District will be responsible for all operation activities. The Anycounty Conservation District and Anytown will assist in the coordination of any required reservoir drawdown and other operation activities to be coordinated with other structures in the watershed.

Maintenance along the shoreline of the reservoir may require the operation of the slide gate to lower the water level for short periods of time to complete the needed maintenance. The principal spillway slide gate and the gate in the water supply bulkhead shall be opened and closed once each year, as a minimum, to ensure proper operation.

Maintenance:

It is the responsibility of the Moose Hill Water District to ensure that the following operation and maintenance items, as a minimum, are addressed annually. The Anycounty Conservation District and Anytown will assist in the coordination of O&M activities and will participate in the inspections.

(1) Vegetation - The dam, auxiliary spillway, and earthen dikes will be established to a native grass cover. Reshape, if necessary, and reseed all bare areas or areas of poor stand, including areas damaged by erosion, freezing, or drought using the original seed mixture. Lime and fertilize as necessary to maintain a vigorous stand.

(2) Trees, Brush, Woody Growth - Control weeds, brush, and woody vegetation on the dam and auxiliary spillway. Woody vegetation, trees, and large shrubs on the embankment, in the outlet channel flow area, and within 10 feet of all concrete structures shall be controlled by spraying or removal. This vegetation shall be killed or removed before it reaches 1 foot in height, or 1 inch in diameter (stalks of woody growth). All pesticide application shall be done in accordance with applicable Federal, State, local, and tribal laws and regulations.

(3) Debris Removal - The auxiliary spillway, principal spillway and both slopes of the dam shall be kept clear of trees, logs, debris, trash, and other obstacles, which will interfere with the proper functioning of the structure.

(4) Embankment and Earth Fill Areas - All soil removed from the embankment, auxiliary spillway, and other earthen appurtenances by erosion, vandalism, rodents, vehicles or other causes shall be replaced to the original slopes and grades. All earthfill shall be an approved material that is compacted and graded to prevent ponding or concentrated drainage. The entire length of the dam shall be visually inspected for cracks and rilling. If and when encountered, the dimensions and locations of major eroded areas shall be recorded and promptly submitted to NRCS for evaluation and recommendations for repair.

(5) Metalwork - All metalwork shall be visually inspected and repaired or replaced if it is damaged or improperly removed. All painted surfaces shall be cleaned and painted when rust starts to appear or the paint system shows signs of peeling or heavy oxidation.

(6) Concrete - Concrete shall be visually inspected for spalls, cracks, misalignment, or structural breakage. Spalls deeper than 1-inch and cracks less than 0.25 inch shall be repaired with cement mortar and sealing compound respectively. Cracks greater than 0.25 inch, misalignments of more than 0.5 inch, and any structural breakage shall be measured and repaired in accordance with NRCS recommendations. Exposed joints shall be visually inspected. Any joints where the sealing compound or joint filler is missing shall be repaired with materials similar to that used in the original construction. Any joints found to have opened more than 1-inch shall be measured and promptly repaired in accordance with NRCS recommendations.

(7) Fences - Inspect all fences and gates at least once each year, and replace posts, wires, and fasteners, as needed.

(8) Gate valves - The principal spillway slide gate and water supply gates will be kept in working order. As a minimum, each gate shall be operated at each annual inspection.

Excessive force shall not be used when operating gates. Repair or replace all nonfunctional hardware such as stem guides, anchors, and anchor bolts.

(9) Auxiliary Spillway - The auxiliary spillway shall be visually inspected both annually and after severe storm events. If auxiliary spillway flows occur and damage occurs, the dimensions and locations of damaged areas shall be recorded and repaired in the manner as described above for the embankment and earth fill areas.

(10) Rock Riprap - Rock riprap on the upstream slope that is dislodged shall be replaced or moved back into its original configuration. Any damaged grouted rock riprap shall be repaired promptly.

(11) Outlet Channel - The water surface in the outlet channel shall be monitored during periods of full pipe discharge. When the water surface in the channel rises to within 6 inches of the pipe conduit invert elevation during flow periods, the outlet channel shall be cleared of trees, silt, or other debris, which caused the rise in water surface. The foundation drain outlet shall be kept open and free of debris and the rodent guard maintained in place.

(12) Access Road - Maintain the access road to the dam in drivable condition. Remove any obstructions to the passage of vehicles and add fill as needed to prevent ponding of water.

(13) Easements/landrights – The terms and conditions of all easements and landrights documents shall be checked for potential violations.

(14) Replacement of Components - The following items are not expected to retain operational capability for the 100-year program life of the dam and are anticipated to be replaced. Timing for replacement should be evaluated during annual O&M inspections.

- trash racks;
- slide gate hardware (stems, stem guides, etc.);
- fences/gates; and
- rodent guards.

A schedule for corrective actions shall be developed for completion of identified maintenance work in a timely manner.

Personnel:

All personnel involved in conducting inspections and performing O&M activities shall be properly trained and equipped. NRCS may assist in training sponsor employees. NRCS shall accompany the sponsor(s) on inspections for the first 3 years after completion of the structure. After the first three annual inspections, NRCS may continue to provide employees to accompany the sponsor during subsequent O&M inspections, if requested by the sponsors and if NRCS resources are available.

O&M Inspections:

Four types of inspections are required to ensure that the flood control and water supply structure functions as designed.

(1) **Monitoring** of the dam will be accomplished to identify and report abnormal conditions between scheduled inspections. Trained personnel of the Moose Hill

Water District will perform monitoring while carrying out their routine duties. Irregularities are to be reported to the water department director.

(2) **Special** inspections will be conducted immediately following severe storms, earthquakes, initial filling of the reservoir, vandalism, and other significant events.

(3) **Annual** inspections will be accomplished in May or June by a qualified engineer using an inspection checklist approved by NRCS. For the first 3 years after installation of the structure, an NRCS engineer shall participate in the annual inspections.

(4) **Formal** inspections shall be conducted at least once every 5 years. These inspections are to be accomplished under the leadership of a registered professional engineer licensed in the State with assistance from other specialists as needed. The State Dam Safety Office will be invited to participate in this inspection. The purpose of the inspection is to determine the safety and structural integrity of the dam, and to determine whether the dam meets the current NRCS and State Dam Safety Agency criteria.

Records:

The Moose Hill Water District shall maintain the following records in a permanent file at the Moose Hill Water District office: a record of all significant actions taken; the cost of performance and completion dates; as-built drawings; permits; and related material. Copies of all inspection reports shall be provided to NRCS and the Anycounty Conservation District.

Hazard Concerns:

This structure is classified as a "high hazard" dam by NRCS and the State Dam Safety Agency. The specific hazard concerns associated with structure A-6-h are located in the downstream flood area. In addition to possible loss of life, a breach of the dam would affect the following:

- 1600 feet of highway 27;
- 3 houses at the lower end of the Elmwood Heights subdivision;
- 3 houses located along the east side of Chestnut Street;
- The Anytown bowling alley and adjacent parking lot; and
- Eddie's carwash and coffee shop.

The Emergency Action Plan (EAP) for this structure outlines a sequential list of contingencies to be followed in the event this structure is subject to imminent failure or periods of high water flow. The Director of the Water department is responsible for ensuring that this plan is reviewed and updated annually. Copies of the updated plan shall be provided to NRCS and to the Director, State Dam Safety Office.

Violations

If NRCS determines that the Moose Hill Water District has failed to comply with the provisions of this O&M Plan, the Moose Hill Water District agrees to reimburse the Federal government for the financial assistance provided for the installation of structure A-6-h. The Federal government also shall have the right to take any further action it deems necessary as per the O&M Agreement.

Anycounty Conservation District
By: **/s/ Fred Smith** Title: **Chairman**

This action was authorized at an official meeting of the Sponsor named immediately above on

Date: **April 5, 2003** Location: **Anytown, Anystate.**
Attest: **/s/ Mary Wright** Title: **Secretary**

Moose Hill Water District
By: **/s/ Janice Jones** Title: **Director**

This action was authorized at an official meeting of the Sponsor named immediately above on

Date: **April 11, 2003** Location: **Anytown, Anystate**
Attest: **/s/ Paula Davis** Title: **Treasurer**

Anytown, Anystate
By: **/s/ Henry Parsons** Title: **Mayor**

This action was authorized at an official meeting of the Sponsor named immediately above on

Date: **April 21, 2003** Location: **Anytown, Anystate**
Attest: **/s/ Ethel Crane** Title: **Executive Secretary**

USDA, Natural Resources Conservation Service
By: **/s/ Elizabeth Jeffrey** Title: **State Conservationist**
Date: **April 30, 2003**